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Team Characteristics and Team Member Knowledge, Skills, and Ability Relationships to the Effectiveness of Cross-Functional Teams in the Public Sector

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ABSTRACT

This study examines members of cross-functional teams in the public sector for the necessary knowledge, skills, and ability (KSA) to be effective team members. It was determined that members of cross-functional teams in the public sector possess the necessary KSA to perform effectively. The following characteristics are statistically significant factors: (1) years of professional work experience; (2) frequency of team participation; (3) the type of team training, i.e., collaboration and performance management; and (4) situational entry to team assignments (volunteered, assigned, requested), specifically volunteer and requested. The findings are significant in that managers within the government have some guidelines on team formation. They now know who should be team members, team members should be volunteers, and management should ensure that the team members have specific training in the areas of team

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collaboration and performance management. The findings are significant for employees as well. To acquire experience, employees should be interested in participating in a team environment (i.e., volunteering for the assignment). They should participate on numerous teams, so that they can become more effective as team members. Employees should acquire training in specific team skills (i.e., collaboration and performance management) to help them better understand how to work within the team and the team members and get results.

Key Words: Cross-functional teams; Team characteristics; Team member knowledge; Team member skills; Effectiveness of cross-functional teams in the public sector; Knowledge, skills, and ability; Effective team members; Public sector teams.

INTRODUCTION

These are revolutionary times that require revolutionary changes. Organizations are reengineering their key processes, creating cross-functional teams to manage these processes. Survival is paramount for these organizations in an environment where change is pervasive and relentless. They must focus on customer needs and services that require redesigning processes and execution.^[1]

Government entities, also, find it necessary to rethink their business practices to service their clientele efficiently and contain costs effectively.^[2] Government agencies are seeking better ways to serve their customers,^[3] struggling to reinvent themselves.^[4]

Government organizations are integrating teams into their business practices to achieve quality. They are abandoning the old management principles of planning, organizing, directing, and controlling, thereby establishing a new set of principles.^[5] Former Vice President Gore conducted a 6-month study of the Federal government's performance regarding leadership and the need for change is in Gore's Report of the National Performance Review.^[6]

Gore searched for team success stories throughout the Federal government. He found a number of agencies using teams to improve processes within their organizations. As a result, Gore formed Reinvention Teams and Labs to plant seeds of reinvention into Federal agencies.^[7] By forming teams, governmental organizations believe they can improve processes by how they use the knowledge and skills of their personnel.^[8]

How did governments become so obsolete? During the 1930s through the 1960s, top-down, large centralized bureaucracies were built to conduct the public's business. These bureaucracies were based on the private sector





hierarchical structure of departments and broke them down into smaller divisions, each with more layers of employees. These layers were further defined by specific rules and regulations. As a result of employees' rigid preoccupation with standard operating procedure, the chains of command, standardized services, and bureaucracies remain steady but operate too slowly.

Through the student movement of the 1960s, the women's movement of the 1970s, and the entrepreneurial movement of the 1980s, many governments remained conservative in their approaches. Political appointees and top management told employees to follow orders, not to think for themselves, and not to take independent actions. They should not take risks, but if they did, they should choose safely.^[9] This is due, in part, because of the loyalty by political appointees to the newly elected presidential administration to carry out the president's programs. Loyalty is crucial to a new administration to ensure that his programs are implemented. Therefore, when presidents make political appointments, the issue is not to improve the bureaucracy, but to gain more control over it.^[10]

Within the Federal government, some agencies resemble monopolies in that they provide services to the public that cannot be offered in the private sector. As a result, there are few incentives to innovate or improve the public sector. Since agencies receive their appropriations (budgets and salaries) from Congress (this is the structure within which the federal government operates in the United States), they try harder to please Congressional appropriation subcommittees rather than the taxpayers from which Congress receives the funds. Therefore, the more taxes collected, the more funds are available to waste on inefficient services to the public.^[10]

Historically, Congress and the White House have given government agencies latitude when implementing public policy, which includes granting the agencies significant influence over the rules, procedures, design, and substance of agency action. Additionally, outside influences encourage bias among bureaucrats. When interest groups and congressional committees support an agency, it is expected that the agency will support those groups in return. The outsiders have supported the bureaucratic policies all along and probably helped initiate them. What they want is the status quo within the agencies.^[11]

In today's environment of rapid change, advanced technologies, global competition, and demanding customers, slow bureaucracies do not work well.^[12] Today, entrepreneurial leaders manage differently. They decentralize decisions through participatory management and use a variety of strategies. These leaders encourage teamwork, recognize employees who innovate, and invest in employees with skills and morale to make the most of their empowerment. Employees are held accountable for their inputs and outputs.^[13]

Former Vice President Gore outlines in the Report of National Performance Review a number of examples where decentralizing decision-making





has improved operations. Robins Air Force Base used teams to cut supervisory staff, and an Agriculture Department personnel office converted to self-managed work teams to improve customer service.^[14] The Federal government is streamlining its procurement practices as well. The U.S. Postal Service^[15] and the U.S. Navy^[16] use cross-functional sourcing teams (also known as purchasing teams or integrated product teams) in the procurement practices.

A Success Story: The U.S. Postal Service

The U.S. Postal Service has adopted the team concept throughout its operations. One team in particular has worked together to identify the root causes of unsuccessful recruitment and identify countermeasures to attract applicants who can qualify on postal maintenance exams.

Mechanics and electronic technicians play critical roles in maintaining the Postal Service's sophisticated mail processing equipment. However, the Postal Service does not have enough of these skilled maintenance employees. Through current recruitment practices, there is a high failure rate on the specialized postal exam for these key positions. Applicants lack the knowledge, skills, and abilities (KSAs) necessary to pass the test.

The Postal Service's competitors are successful in their recruitment efforts by expertly selling themselves as a business and as an employer to prospective hires. The Postal Service must compete with these companies for the same skill set. Historically, the Postal Service had little need to recruit because of a reputation for job security, which attracts individuals to apply for postal positions. This, however, is no longer the case, since the labor market is now much more competitive, as the Postal Service's Maintenance Management department was experiencing.

The Maintenance Management department needed assistance to find out what they could do to turn things around. So, Ms. Carol Booher, a Human Resources Selection Specialist, lead a core team of Human Resources specialists to review the Postal Service's recruitment practices. The core team enlisted other functional areas when needed, i.e., Diversity, Retail and Marketing, and Safety, to accomplish the team's goal: to elevate the Postal Service's image in recruitment and to recruit those persons who already have the KSAs to pass the postal exam.

Task One

The first task the team undertook was to review the backgrounds of current technicians and mechanics who were hired into the Postal Service in the last two years. This was done to develop a profile of successful applicants.





The findings were extraordinary. Those who passed the exam successfully came out of the manufacturing industry and had mechanical experience. These applicants had more experience, i.e., four or five years, than had been expected. The Postal Service had been recruiting from trade schools and those applicants did not have the necessary experience to meet postal requirements. Therefore, an adjustment in the Postal Service's recruitment approach was required to target experienced and skilled workers.

As a result of the analysis, the Postal Service recruitment efforts were revised and an advertising campaign was developed where ads were placed in the Sports sections of newspapers rather than in the Classified section. Additionally, instead of recruiting from current trade school students, the Postal Service used the alumni lists from these schools, and recruited from the manufacturing industry.

Task Two

The team developed recruitment packages for a pilot job fair in Nashville which highlights the Postal Service's technical aspects of the positions in plain English, no postal terminology. These packages discussed the type of equipment employees repair and maintain, as well as information on postal benefits and salaries.

The team developed artwork on CDs, so that the plants had flexibility to include information about their own facilities. Videos were produced to welcome people to the job fair as a sample for future videos, along with a sample commercial for advertising. Sample scripts were included, so that local plants could produce their own videos. A checklist was also provided to help the plants conduct open houses for applicants.

The team compared Nashville data from the prior two years to data from their pilot recruitment effort. The exam pass rate for mail processing equipment mechanic applicants improved by 157% over the prior pass rate for that exam.

The team did not accomplish their goals without some challenges. According to Ms. Booher, there was huge pressure to be successful, as they did not want to let down their customer, Maintenance Management. It was important that the team gather data, so that there was a real understanding of the issues, and even more challenging to keep disciplined to get the data. This team was comprised of individuals who were not solely dedicated to this project, so it was difficult to take people away from their primary work. It was important to provide a vision of success to keep people motivated. The most demanding effort was to match the people on the team with the right skill set to a task. Through it all, the team managed to maintain contact with other members not in the same location as the core team.

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Ms. Booher offers this advice to prospective teams for successful results:

- Offer solutions to team members should they need advice on how to tackle their tasks.
- Take away work that will keep members from working on the project, so that the current task will keep moving.
- Follow up with members on their commitments to action items.
- Say “thank you.”
- Never offer negative comments.
- Ask if the team members have everything they need to proceed with their task.

This team and the program, “Building Tomorrow’s Postal Service,” is a candidate for a Postal Quality award for their excellence and innovation on developing this recruiting program.

THEORY AND HYPOTHESES

Team Effectiveness

Parker^[17] states, “...not every group is a team and not every team is effective.” There is no one commonly accepted meaning of work-group effectiveness, nor have researchers come up with a single indicator of effectiveness.^[18]

Lewin developed the study of group dynamics, particularly, the behavior of a team and the forces that explain its actions. In his research, Lewin’s force field analysis focuses on applying change to a team to keep it in a state of equilibrium or effectiveness. Lewin views a team as an open social system that receives forces or vectors from each side. It is when the forces become unequal that the team becomes ineffective.^[19]

McGregor^[20] and his colleagues and Likert^[21] develop lists of characteristics for effective and ineffective teams. McGregor’s list focuses on management teams in particular and Likert’s list, similar in nature to McGregor’s, focuses on a team’s process or internal dynamics.^[22]

Argyris^[23] focuses on organizational effectiveness that impacts the interpersonal competence of team members. Argyris also looks at how the organization supports positive norms, such as openness, experimentation, individuality, thoughtfulness, concern, internal commitment, candidness, encouraging candidness, assisting with experimentation, and encouraging openness.^[24]





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Blake and Mouton^[25] link management style with effectiveness in their concept called the Managerial Grid. The grid has a vertical and horizontal axis; the vertical axis measures a manager's concern for people and the horizontal axis measures a manager's concern for productivity. This grid is used to improve overall team effectiveness as well as individual effectiveness of each team member.^[26]

Hackman and Oldham^[27] define team effectiveness as (1) the team's ability to produce an output that meets or exceeds an organization's performance standards or expectations; (2) the team experience serving more to satisfy than frustrate the personal needs of team members; and (3) the team's ability to work together on future assignments as a result of the social process engaged in to carry out current tasks.

Effectiveness Variables

Through the years numerous models evolved to examine the technology, cohesiveness, and norms related to team effectiveness.^[28] These models^[29–33] offer the basis of some of the more significant contributions in the area of team effectiveness variables.

The criteria of effectiveness for cross-functional teams are many and varied. Success of any project may require that all criteria be met if a project is to be successful. However, according to Stevens, much of the literature on team effectiveness falls into two categories—self-management and interpersonal KSA. Self-management involves the team collectively managing the team's basic managerial and/or supervisory functions. These include goal setting and performance management and planning and task coordination. Interpersonal skills include conflict resolution, collaborative problem solving, and communication.^[34] These are considered catch all phrases for a variety of necessary individual and group functions: listening, giving performance feedback, making one's point at a team meeting, group problem solving, learning a new job, peer counseling, conducting team meetings, resolving conflict, working collaboratively, just to name a few.^[35]

Cross-Functional Teams

The cross-functional team concept, formulated in the business industry^[36] is also known as an interfunctional team^[37] or an integrated product team.^[38] These teams are composed of personnel from various disciplines working together to make their organizations more competitive and successful. Team members work together to develop new products and bring them to the

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marketplace, prepare a long-term corporate strategy, or upgrade service quality in a government entity using a procedure developed by the team.^[39]

These teams are composed of personnel from various disciplines working together to make their organizations more competitive and successful. Team members work together to develop new products and bring them to the marketplace, prepare a long-term corporate strategy, or upgrade service quality in a government entity using a procedure developed by the team.^[40]

Cross-functional teams are used to break down barriers in an organization where division of labor and divisions of task are prevalent. It is usually after an organization flows its processes when it becomes clear departments are working at cross-purposes. This approach differs from the traditional government approach.^[41]

There are some within these agencies who resist team-based quality processes. These individuals are concerned there is no advantage to process improvement. They believe they will be forced to do more with less if budgets are cut due to increased efficiencies.^[42]

The public sector with and without partnering with the private sector is making use of cross-functional teams within its organizations, in particular cross-functional sourcing teams. Governmental agencies are adopting this concept to develop new business strategies and to improve processes, reducing costs and providing better services to their customers.^[43]

Justification of the Study

Stevens^[44] conducted research on the KSA requirements needed to be an effective team member in self-managed groups. However, this current study is important because no study has been conducted to determine whether participants on cross-functional teams in the public sector have the required KSA to contribute effectively as team members. This study attempts to fill a gap between teams, in general, in the private sector and teams in the public sector, in particular, cross-functional teams.

METHODS

Hypotheses

The author designed the study to determine whether a team member is capable of contributing to the effectiveness of the team based on the following variables: (1) number of years of professional work experience; (2) the frequency of participation on a team; (3) the type of team training





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received; and (4) situational entry to team assignments (volunteered, assigned, or requested). Based on these variables, the following hypotheses were developed:

H1: There is a relationship between the number of years of professional work experience of team members and the KSA score.

H2: There is a relationship between the frequency of team participation and the KSA score.

H3: There is a relationship between the type of team training a team member receives and the KSA score.

H4: There is a relationship between situational entry to team assignments (volunteered, assigned, requested) and the member's KSA score.

Study Subjects

The targeted population identified for this study is the public sector, i.e., federal, state, county, city, and other local governments, throughout the U.S. Although the cross-functional team population in the public sector is finite, for this study only those contacted to participate in the study are considered the sample population. It is not possible to determine the actual number of cross-functional teams throughout the public sector at any given time, as teams begin and end continuously.

Teams were located throughout federal, state, and local governments. Of the 40 teams contacted, 24 agreed to participate. Of those teams participating, a total of 138 team members completed the demographic survey and Teamwork—KSA Test, with teams varying in size from 3 to 15 members. There are 20 federal teams (numerous DoD agencies and an independent agency), three state teams (Minnesota and South Carolina), and 1 local (Canadian city) team participating in the study. Although county teams had been located, no county governments participated in this research.

Instrument

The instrument used for this study is Dr. Michael Stevens' Teamwork—KSA Test. The instrument design is based on Stevens' research of the necessary characteristics of effective individual team members, in particular, the potential KSA requirements for effective teamwork. The Teamwork—KSA Test includes 35 questions related to both interpersonal and self-management

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KSAs. The questions fall into five subgroups within the interpersonal and self-management KSAs as outlined below.^[45]

- Interpersonal:
 - Conflict Resolution—constructive conflict, types and sources of conflict, and negotiation or bargaining.
 - Collaborative Problem Solving—group participation in problem solving and obstacles to collaborative problem solving.
 - Communication—communication networks, communication style, listening skills, nonverbal communication, and small talk and ritual greetings.
- Self-management:
 - Goal Setting and Performance Management—specific, challenging, and accepted goals; and performance monitoring and feedback.
 - Planning and Task Coordination—activity coordination and task and role expectation.

The instrument is designed to measure how a team member would react to situations in a team-oriented work environment. Each question has one answer that is determined to be the ideal answer, although some of the alternative answers may be partially correct, but not complete. Meaning, there may be an answer to each question that answers the question more directly, while the others could be partial answers related to the best answer.^[46]

Variables

The Teamwork—KSA Test consists of five variables (subgoals) and 14 KSA questions. Those variables are defined below.

Goal Setting and Performance Management

The team has developed a vision, mission, and clear set of goals that are shared by all team members. Clear goals are important to cross-functional teams, as they reduce the potential for conflicts. This minimizes prior differences among the various functions, as the functions often come to the team believing their contributions are more important than others. These functional areas (e.g., Marketing, Legal, Engineering, etc.) often believe they have precedence over the other areas or that they have special clout when making decisions.^[47] The goals of the team rationalize its existence. Without clear goals, the team would suffer from tension, arguments, and cross-purposes.^[48]





Members of the team willingly accept the goals and expectations without resentment. There are no anxieties, fears, and emotional stresses often resulting direct pressure from a boss in hierarchical situations. The team is capable of setting high goals for the group as a whole and for each individual. The goals are set high enough to stimulate each member but not so high as to create anxiety or fear.^[49]

Planning and Task Coordination

Members are clear about what is expected of them and of their team members.^[50] The task or objective of the team is well understood and accepted by the members.^[51,52]

It is critical to a team that it is composed of talented individuals with the right expertise that will add to the effectiveness of the group. In situations where teams have political agendas, individual team members may address the right issues but may not be capable of carrying out the assignment it was entrusted to do.^[53]

Conflict Resolution

Differences of opinion are resolved openly and constructively.^[54] Criticism is of a constructive nature to remove obstacles that may prevent the project from getting done.^[55,56] There are no signs of avoiding, smoothing over, or suppressing conflict.^[57]

Collaborative Problem Solving

Team members have the opportunity to participate in key team decisions.^[58] The group is receptive to how members carry out their work, including the methods they use and how they set priorities.^[59] As appropriate, customer and/or suppliers are included in team decisions.^[60]

The team's primary emphasis is on satisfying the customer's/client's needs.^[61] There is continual interaction between the team and the customer.^[62,63] Also, where applicable, teams with supplier's participation benefit from the support and involvement.^[64] The team appreciates and uses the cultural and style differences represented on the team.^[65] Diverse teams generally offer multiple decision options, making the group more effective.^[66]

Communication

The team does a good job developing relationships with other teams, clients, and key stakeholders, and feels free to express their views on key





issues.^[67] Members listen to each other and opening offer creative thoughts.^[68] The team makes effective use of non-meeting methods (e.g., Local Area Networks) to communicate information.^[69] Team participants must have available ongoing source of relevant information so the team can adjust its operation, or change short-term goals, or shift team resources and skills.^[70,71]

The team is highly motivated to communicate fully to its team members all relevant information that adds value to the team's activity. Each team member must feel important, and no agenda item is overlooked without receiving the attention it deserves.^[72]

Statistical Techniques and Analyses

The Teamwork KSA Test produces 35 points. The test score represents whether a team member has the necessary KSAs to be an effective team member and is the primary dependent variable in the analysis. The total of all the team members will be integrated into a team score to determine whether the team as a whole has the necessary KSAs to be an effective team.

Team member scores will be graded as high, medium, and low dependent upon how they scored compared to the others in the sample. Those with scores more than one standard deviation above the mean will be considered high (quality skill usage). Those with scores more than one standard deviation below the mean will be considered low (must have training for the team to operate with greater team efficiency). All others will be medium (adequate skill usage, can improve with training). Frequencies for those in each of the three groups for the overall Teamwork—KSA instrument and its KSA subscales will be presented.

Hypothesis testing uses *t*-tests and one-way analysis of variance (ANOVA) to test for statistical differences on the dependent variable, team KSAs for team member effectiveness. A hypothesis is rejected if the difference between means on effectiveness is proven at the 0.05 level of statistical significance.

RESULTS

Demographics of Involved Population

The cross-functional team samples are from teams in the public sector, namely, federal, state, and local governments. Since teams are very fluid, starting and disbanding as necessary, it was necessary to locate the teams by conducting research via the Internet, calling government agencies directly, and receiving referrals.





The study participants' years of professional experience ranged from 1 to 26+. Of the 135 participants answering this question, 113 members or 84% have between 11 to 26+ years of work experience. The 131 participants answering this question indicated they worked in one to eight plus functional areas and represented this functional area on a team. One hundred seventeen study participants indicated they served on cross-functional teams multiple times, ranging from 1 to 16 plus teams throughout their career.

Of the 136 persons responding this question, 45% of the team participants are women. In each of the five categories, women scored higher than their male counterparts (Table 1).

Descriptive Statistics

Team members were asked to select the best answer to 35 multiple-choice questions that relate to the characteristics listed above. The participants were not told which category related to each the question. The team scores are the total scores of each team member rolled up to provide an overall score—indicating a team's KSA in the five effectiveness categories.

Cronbach's Alpha is a measure of internal consistency reliability for instruments expecting patterned responses. The higher the Cronbach's Alpha reliability coefficient, the more consistent and reliable the instrument will measure what it is intending to. The larger the number of items, and the larger the sample size, the easier it is to prove internal consistency.

The overall instrument has a reliability coefficient of 0.657, which is fair for an instrument with only one correct response out of four possibilities. The subscales, mostly due to a lower number of items, have less reliability. The four-item conflict resolution scale and the five-item goal setting and performance management scale have predictably lower reliability (0.282 and 0.267). However, the planning and task coordination scale, also only five items, has a much more respectable 0.451 reliability coefficient. The 9-item collaborative problem solving subscale also has a reasonable reliability of 0.485. The communication scale has a reliability coefficient of 0.249, which is low for a 13-item instrument. Results from its use are treated with more suspicion in this analysis.

To determine the level of KSA (high, adequate, or low) of the cross-functional teams participating in the study, a standard deviation was determined at 4.0767 and the mean KSA score at 25.8768. Those teams' whose scores are one standard deviation above the mean (a score of 29.9535 or higher) are considered to have high skills. Teams' whose scores are one standard deviation below the mean (a score of 21.8001 or lower) indicate inadequate skill sets to be effective teams. Team scores that fall between 21.8001 and 29.9535 indicate





Table 1. Knowledge, skills, and ability scores by gender.

Gender	Conflict resolution	Collaboration	Communication	Goal setting and perf. mgmt	Planning and task coordination
Male					
Mean	3.0267	6.0400	8.0400	4.1333	4.3067
N	75	75	75	75	75
Standard deviation	0.9149	1.7587	1.7892	1.0045	1.0131
Female					
Mean	3.1967	6.1639	8.2623	4.2295	4.3770
N	61	61	61	61	61
Standard deviation	0.8128	1.8091	1.7407	0.8245	0.8595
Total					
Mean	3.1029	6.0956	8.1397	4.1765	4.3382
N	136	136	136	136	136
Standard deviation	0.8716	1.7759	1.7646	0.9260	0.9445



adequate skill sets to be effective teams. Table 2 outlines the team score, KSA level, and the number of team members for each team.

Overview of Significant Findings

Hypotheses testing data was gathered from cross-functional teams in the public sector to determine whether team members have the KSA to be effective team members in five categories—conflict resolution, collaborative problem solving, communication, goal setting and performance management, and planning and task coordination. Only hypothesis test results of an alpha level of <0.05 are statistically significant.

There are significant findings from this study in four hypotheses tested. There is no relationship between the number of years of professional work

Table 2. Cross-functional team data.

Team identity	Public sector	Mean	No. of team members	Team KSA level
Team 1	Federal	25.75	4	Adequate
Team 2	Federal	28.33	3	Adequate
Team 3	Federal	23.67	3	Adequate
Team 4	State	28.86	7	Adequate
Team 5	State	27.50	8	Adequate
Team 6	Federal	25.33	6	Adequate
Team 7	Federal	27.25	4	Adequate
Team 8	Federal	28.33	6	Adequate
Team 9	Local	24.00	5	Adequate
Team 10	Federal	29.00	3	Adequate
Team 11	Federal	26.40	5	Adequate
Team 12	State	26.80	15	Adequate
Team 13	Federal	26.00	7	Adequate
Team 14	Federal	26.80	5	Adequate
Team 15	Federal	29.00	4	Adequate
Team 16	Federal	23.67	3	Adequate
Team 17	Federal	28.60	5	Adequate
Team 18	Federal	25.90	10	Adequate
Team 19	Federal	26.00	1	Adequate
Team 20	Federal	29.33	6	Adequate
Team 21	Federal	26.00	4	Adequate
Team 22	Federal	20.10	10	Low
Team 23	Federal	21.50	6	Low
Team 24	Federal	21.43	7	Low

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experience of team members and the KSA score. There is a significant difference between years of professional work experience and KSA scores as indicated in Tables 3 and 4.

There is no relationship between the frequency of team participation and the KSA score. There is significant difference between frequency of team participation and KSA scores as indicated in Tables 5–8.

There is no relationship between the type of team training a team member receives and the KSA score. There is significant difference in collaboration and performance management based on the number of these courses taken as indicated in Tables 9 and 10.

There is no relationship between situation entry to team assignments (volunteered, assigned, requested) and the member's KSA score. There are significant differences between volunteer or assigned team participation and total KSA scores as indicated in Tables 11–15.

RESULTS

Table 3, below, displays the mean KSA scores for groups of team members with various years of professional work experience. The table shows that mean KSA scores are higher for team members who have more professional years of experience. Team members with 26 or more years of experience have a mean KSA score of 27.96, whereas those with only one to five years have a mean KSA score of 24.61. Mean KSA scores generally increase as years of experience rise, as expected.

Table 3. Mean total KSA score by professional years of experience.

Professional years of experience	N	Mean	Standard deviation	Standard error	95% confidence interval for mean	
					Lower bound	Upper bound
1 to 5	6	24.1667	2.9944	1.2225	21.0242	27.3091
6 to 10	16	21.3125	5.1603	1.2901	18.5627	24.0623
11 to 15	31	26.1935	3.8594	0.6932	24.7779	27.6092
16 to 25	52	26.2885	3.2979	0.4573	25.3703	27.2066
26 or more	30	27.9667	2.8465	0.5197	26.9038	29.0295
Total	135	25.9556	4.0276	0.3466	25.2700	26.6412



Table 4. Analysis of variance—total KSA score by professional years of experience.

Years of experience	Sum of square	df	Mean square	<i>F</i>	Sig.
Between groups	492.984	4	123.246	9.533	0.000
Within groups	1680.749	130	12.929		
Total	2173.733	134			

One-way ANOVA is the tool used to test whether there is a statistically significant difference between these groups on the dependent variable, total KSA score. Table 4 shows that the between group variance on total KSA score has an *F* score of 8.568 and a significance level of $\alpha < 0.00$, which is beyond the $\alpha < 0.05$ level required to show significant difference. Null hypothesis H_{10} has been rejected. There is a relationship between years of professional work experience and KSA scores.

Table 5 displays the mean KSA scores for groups of team members with differing amounts of experience serving on teams. Team experience ranges from participation on one team to over 200. For purposes of this analysis, team members are grouped into the team experience categories shown in the first column. The table shows that mean KSA scores rose from a low of 24.25 for those who served on from one to four teams, to 27.48 for those who served on more than 16.

Analysis of variance is used to test whether there is a statistically significant difference between these groups on the dependent variable, total KSA score. The table following shows that the between group variance on total KSA score has an *F* score of 4.236 and a significance level of $\alpha < 0.007$, which more than meets the criteria of $\alpha < 0.05$ required to show significant difference. Therefore, Hypothesis 1 is supported. There is a relationship between years of number of teams served on and KSA scores.

The relationship is also shown using total number of cross-functional teams as the independent variable. Knowledge, Skills, and ability scores rise for groups who have served on higher numbers of cross-functional teams.

Again, the relationship is significant at the $\alpha < 0.05$ level. Therefore, Hypothesis 3 is supported. There is a relationship between total KSA scores and the number of cross-functional teams worked on.

T-tests were run to determine if those who had courses in communication, collaboration, conflict resolution, project management, goal setting, performance management, or a combination of those skills, scored significantly different on the KSA tests for those skills than those team members who had no courses in the subject. In six separate two-tailed *T*-tests for significant





Table 5. Mean total KSA score by number of teams served on.

Total number of teams served on	<i>N</i>	Mean	Standard deviation	Standard error	95% Confidence interval for mean	
					Lower bound	Upper bound
1 to 4	24	24.2500	4.1310	0.8432	22.5056	25.9944
5 to 8	25	25.1600	4.5978	0.9196	23.2621	27.0579
9 to 15	27	25.6667	4.6492	0.8947	23.8275	27.5058
16 or more	47	27.4894	2.9331	0.4278	26.6282	28.3506
Total	123	25.9837	4.1051	0.3701	25.2510	26.7165



**Table 6.** Analysis of variance—total KSA score by number of teams served on.

Number of teams served on	Sum of square	df	Mean square	<i>F</i>	Sig.
Between groups	198.363	3	66.121	4.236	0.007
Within groups	1857.605	119	15.610		
Total	2055.967	122			

differences in KSA scores, none met the criteria of $\alpha < 0.05$ required for significance. However, One-way ANOVA on groups with varying numbers of courses in these subject matters did produce some significant differences.

Table 9 displays the mean Collaboration KSA scores for groups who have taken varying numbers of training courses in collaboration. Twenty-six team members had taken no courses in the selected subject area. Forty-three team members had taken one collaboration course, thirty-three had two or three, and the remaining sixteen had four or more. Collaboration scores ranged from 5.6 to 6.7, with those who had no courses scoring the highest. Analysis of variance produced a between groups variance with a *F* score of 3.96, producing a significance level of $\alpha < 0.01$. There is a significant difference in KSA scores between groups who have taken varying numbers of collaboration courses.

A slightly more linear relationship can be seen in Table 10, which displays the mean Total KSA scores for groups who have taken varying numbers of training courses in performance management. Thirty-one team members had taken no courses in the selected subject area. Forty-two team members had taken one performance management course, thirty-two had two or three, and the remaining sixteen had four or more. Total KSA scores ranged from 24.73 to 27.59, with scores generally getting higher with more courses. However, those who had no courses in performance management were not the lowest scoring group.

Analysis of variance produced a between groups variance with a *F* score of 4.147 producing a significance level of $\alpha < 0.008$. There is a significant difference on total KSA scores between groups who have taken varying numbers of performance management training.

Another aspect that was analyzed was how well both genders were represented on the teams and whether gender impacted how they became involved with teams. It is evident from the data that both genders were represented, as illustrated in Table 11. Overall, females were assigned to teams or requested to be on teams more often than males. Males, however, volunteered more often to participate on teams.





Table 7. Mean total KSA score by number of cross-functional teams served on.

Number of cross functional teams served on	N	Mean	Standard deviation	Standard error	95% Confidence interval for mean	
					Lower bound	Upper bound
1 to 4	43	24.8605	4.5700	0.6969	23.4540	26.2669
5 to 8	30	26.5000	4.0322	0.7362	24.9944	28.0056
9 to 15	26	27.6154	2.9131	0.5713	26.4388	28.7920
16 or more	18	27.0556	2.9400	0.6930	25.5935	28.5176
Total	117	26.2308	3.9965	0.3695	25.4990	26.9626



Table 8. Analysis of variance—total KSA score by number of cross functional teams served on.

Number of cross-functional teams served on	Sum of square	df	Mean square	<i>F</i>	Sig.
Between groups	145.008	3	48.336	3.198	0.026
Within groups	1707.761	113	15.113		
Total	1852.769	116			

Another analysis was comparing Total KSA scores and how team members became involved with a team. Three One-way ANOVAs are run to determine if there is a difference in Total KSA scores depending on the number of team participation due to volunteering for a team, being assigned to a team, or requested to participate on a team.

The first, represented in Table 12, shows that KSA scores are generally higher for those groups with more volunteer experience, going from a low of 24.96 for those with only 2 or 3 volunteer team experiences to 27.67 for those with 4 or 5 volunteer experiences.

The KSA scores for those groups with varying numbers of assigned team participation are also significantly different. Those with only one assigned experience have the lowest mean KSA score, 24.27, and those with six or more assigned experiences have the highest mean score, 27.14. The mean difference between groups is significant with an *F* of 2.82 and a significance alpha of 0.043.

There was no difference in mean KSA scores between groups who requested team assignments more or less than others. Mean KSA scores varied from a low of 25.31 to a high of 27.63, but the differences were not enough to meet the requirement for statistical significance.

The null hypothesis H_{5_0} has been rejected. There is a relationship between situational entry to team assignments (volunteered, assigned, requested) and the members KSA scores. Those with high numbers of volunteer or assigned team participation had higher KSA scores. However, no one method of team involvement seems to be related to higher KSA scores more than another.

Table 15 indicates the bivariate correlations between total KSA score and the actual number of volunteer, assigned, and requested team experiences. None of them correlate significantly ($\alpha < 0.05$). The correlations reveal that those with a high number of volunteer experiences also have a high number of assigned and requested experiences as well. All correlations





Table 9. One-way ANOVA—mean total KSA score by number of collaboration courses taken.

Number of courses in collaboration	N	Mean	Standard deviation	Standard error	95% confidence interval for mean	
					Lower bound	Upper bound
None	26	6.7692	1.3945	0.2735	6.2060	7.3325
1	43	5.6047	1.7476	0.2665	5.0668	6.1425
2 or 3	33	6.5152	1.5232	0.2652	5.9751	7.0552
4 or more	16	6.6875	1.6215	0.4054	5.8235	7.5515
Total	118	6.2627	1.6560	0.1524	5.9608	6.5646
ANOVA	Sum of square	df	Mean square	F	Sig.	
Between groups	30.282	3	10.094	3.960	0.010	
Within groups	290.574	114	2.549			
Total	320.856	117				



Table 10. Analysis of variance on mean total KSA score by number of performance management courses taken.

Number of performance management courses taken	N	Mean	Standard deviation	Standard error	95% confidence interval for mean	
					Lower bound	Upper bound
None	31	26.4839	2.8032	0.5035	25.4556	27.5121
1	42	24.7381	4.8643	0.7506	23.2223	26.2539
2 or 3	32	27.5938	2.6134	0.4620	26.6515	28.5360
More than 4	11	27.0909	2.2563	0.6803	25.5751	28.6067
Total	116	26.2155	3.7667	0.3497	25.5228	26.9083
Performance management	Sum of square	df	Mean square	F	Sig.	
Between groups	163.123	3	54.374	4.147	0.008	
Within groups	1468.489	112	13.112			
Total	1631.612	115				



Table 11. Team participation.

Method of entry in team participation	Gender					
	Male		Female		Group total	
	Mean	Count	Mean	Count	Mean	Count
Number of teams volunteered for	2.84	75	2.76	61	2.80	136
Number of teams assigned to	3.11	75	3.17	61	3.13	136
Number of teams requested for	2.90	75	2.95	61	2.92	136

between types of situational entry to team assignments were significant, but none significantly correlated to the subjects' total KSA scores.

IMPLICATIONS

This study contributes to team effectiveness in cross-functional teams in the public sector. It shows that team participants have the necessary KSA to be effective team members. They are influenced by the number of years of professional experience, the number of teams they have participated on, the type of training each team member has had and the number of courses, and how they came to be a team member team, (i.e., volunteered, assigned, or requested).

This study has a number of implications for political appointees, senior and middle managers, team leaders, and team participants.

Professional Experience

Based on this current research, the more years of professional experience of the public sector cross-functional team members, the higher the KSA test score.

It is apparent from this study that one way that team members gain their knowledge, skills, and ability to be effective team members is during their careers—the more years of professional work experience, the higher the KSA



Table 12. Analysis of variance on mean total KSA score by number of teams volunteered for.

Number of teams volunteered for	N	Mean	Standard deviation	Standard error	95% confidence interval for mean	
					Lower bound	Upper bound
1	11	27.1818	2.9264	0.8823	25.2159	29.1478
2 or 3	26	24.9615	4.9918	0.9790	22.9453	26.9778
4 or 5	21	27.6190	2.0851	0.4550	26.6699	28.5682
6 or more	30	27.3000	3.1310	0.5716	26.1308	28.4692
Total	88	26.6705	3.6975	0.3942	25.8870	27.4539
ANOVA	Sum of square	df	Mean square	F	Sig.	
Between groups	109.593	3	36.531	2.842	0.043	
Within groups	1079.850	84	12.855			
Total	1189.443	87				

Note: The difference was significant, with an *F* score of 2.84 and a significance level of 0.043.





Table 13. Analysis of variance on mean total KSA score by number of teams assigned to.

Number of teams assigned to	N	Mean	Standard deviation	Standard error	95% confidence inter- val for mean	
					Lower bound	Upper bound
1	11	24.2727	4.2683	1.2869	21.4053	27.1402
2 or 3	20	25.7500	4.1912	0.9372	23.7885	27.7115
4 or 5	22	25.0000	4.3861	0.9351	23.0553	26.9447
6 or more	54	27.1481	3.3669	0.4582	26.2292	28.0671
Total	107	26.1495	3.9401	0.3809	25.3943	26.9047
ANOVA	Sum of square	df	Mean square	F	Sig.	
Between groups	124.861	3	41.620	2.819	0.043	
Within groups	1520.747	103	14.765			
Total	1645.607	106				



Table 14. Analysis of variance on mean total KSA score by number of team assignments requested.

Number of teams assignments requested	N	Mean	Standard deviation	Standard error	95% confidence interval for mean	
					Lower bound	Upper bound
1	14	25.7143	4.1774	1.1165	23.3023	28.1262
2 or 3	19	25.3158	4.4728	1.0261	23.1600	27.4716
4 or 5	19	27.6316	2.3145	0.5310	26.5160	28.7471
6 or more	39	27.2308	3.0648	0.4908	26.2373	28.2242
Total	91	26.6813	3.5241	0.3694	25.9474	27.4153
ANOVA	Sum of square	df	Mean square	F	Sig.	
Between groups	77.452	3	25.817	2.159	0.099	
Within groups	1040.307	87	11.958			
Total	1117.758	90				





Table 15. Correlations between total KSA score and the actual number of volunteer, assigned, and requested team experiences.

Correlations between total KSA score and number of situational membership		Total KSA score	Number of teams volunteered for	Number of teams assigned to	Number of teams requested for
Total KSA score					
Pearson correlation		1.000	0.116	0.180	0.093
Sig. (2-tailed)		—	0.222	0.054	0.330
<i>N</i>		138	113	116	111
No. of teams volunteered for					
Pearson correlation		0.116	1.000	0.639	0.625
Sig. (2-tailed)		0.222	—	0.000	0.000
<i>N</i>		113	113	112	110
No. of teams assigned to					
Pearson correlation		0.180	0.639	1.000	0.789
Sig. (2-tailed)		0.054	0.000	—	0.000
<i>N</i>		116	112	116	111
No. of teams Requested for					
Pearson correlation		0.093	0.625	0.789	1.000
Sig. (2-tailed)		0.330	0.000	0.000	—
<i>N</i>		111	110	111	111



test score. Through years of seeking out opportunity for new experiences and experiences dealing with people, these team members have gained the necessary KSA to become effective team members. Managers and team leaders who are in a position to select team members may want to consider the number of years of professional experience a potential team member possesses. Although, it may seem practical to just include members on a team with many years of professional experience, it is important to include those novice members on the team as well.

However, it appears that those team members who have the necessary KSA to be effective team members are persons who have been in the work force for some time. Office of Personnel Management states that by 2010, 40% of the federal workforce will be eligible to retire. Currently, there is a staffing shortage in the federal government. If the government is unable to recruit younger workers today, whom will the older workers coach to follow in their footsteps as effective team participants before they retire?

Team Experience

According to Parker,^[73] cross-functional teams provide an arena for interpersonal and cross-cultural learning. Working on various cross-functional teams, individuals have an opportunity to work with a variety of different people, developing their own interpersonal skills. They also develop a level of comfort working with a diverse group of people. Team members have an opportunity to be exposed to cross-cultures within their organization, which they may not be exposed to otherwise. This study validates this concept. The more general and cross-functional team individuals participated on, the higher their score on the KSA test.

Bandura^[74] believes that a successful job experience has an impact on individuals' efficacy. May and Schwoerer^[75] take this one step further and apply this concept to their model for fostering work team efficacy and effectiveness. One aspect of the model indicates that individuals through their job experiences, build skills, and learn to cope with various situations. When these skills are brought together in a team situation, depending upon the success levels of these individuals, they may be used as indicators for the level of collective efficacy.

The study results indicate that the more teams a person participates on a team, the more KSA he or she acquires to be an effective team member. Just as the person who meets the success profile to be an effective team member through the years of professional work experience, a person who has extensive experience in teams also gains the necessary experience to be an effective team member as well. A manager may want to survey the team leader to find out





what is the successful team member profile data and team membership makeup.

Of course, one may make the argument that an employee does not get team experience if not selected for a team. Managers and team leaders should consider this aspect when considering their employees' professional development. Managers and team leaders should both assign employees to participate on teams and encourage them to volunteer for team assignments.

According to Quick,^[78] a valuable benefit of task forces is in training and development. With classroom learning where most training takes place, the learner most often cannot relate the reward of changing one's behavior because he or she is not in the work environment where feedback is available. A learner may not be motivated to apply new techniques should there be a time lapse from the classroom learning to applying techniques at work. However, with participating on a task force, a member can almost receive simultaneous feedback and reinforcement for effective behavior. It does not take members long to determine whether they are being effective with others. Accomplishing a goal provides a reward for learning.

Quick further states that participating on a task group also provides job enrichment. This challenges employees, makes work more important and interesting, and keeps employees in a learning and growth situation. Therefore, managers should consider a mix between experienced team members and novice members, so that the novice members can learn and observe team interaction from the experienced team members.

Training

With regard to training, from this study it appears that of those team members who took collaborative courses, the more courses they took, the higher their collaborative score. The study also indicates that 22% of the 118 team members had not taken any collaborative courses, but had the highest mean collaborative score. Collaborative problem solving is one's ability to participate at solving a problem, recognize obstacles to solve the problem, and implement corrective action to solve the problem.^[79] Katzenback and Smith^[80] state that most persons have potential to learn skills needed in teams. If this potential exists, team dynamics may cause the skill to develop. This could explain how 22% of the study participants had the highest collaborative scores—collaborative problem solving developed over one's career and participating on teams.

Organizations use teamwork to solve problems and implement solutions or strategies. Of the 118 team members, 78% had taken collaborative courses. The more of these courses that were taken, the more collaborative problem





solving appears to have become ingrained. A manager or person sponsoring a team needs to consider the objectives of that team. If this team is formed to analyze problems and develop solutions, it is imperative that team members who are selected have a strong collaborative trait. This is particularly important in cross-functional teams. Drucker^[81] states that it is critical for team members to constantly bring to the attention of the team decisions that need to be made. If that is not done, there is a danger that the team will make decisions that could irreversibly comment the entire organization. Therefore, without understanding how collaborative problem solving impacts a team and the organization, a team will not develop the right solutions for the real problems.

Another area for training that becomes apparent from the study relates to goal setting and performance management. Approximately 27% of the 116 participants did not score the lowest on the KSA test. However, KSA test scores were higher for those who took two or more training courses in performance management. This may be the result of team members being exposed repetitively to similar information, reinforcing key elements of performance management.

A manager, team sponsor, or team leader should consider whether or not team members have been exposed to performance management either through training or on the job experiences when selecting them for a team. According to Osborne and Gaebler, "Organizations that measure the results of their work—even if they do not link funding or rewards to those results—find that the information transforms them." It is, therefore, important for a team to monitor its performance to ensure that it is accomplishing the goals and objectives that it has set out. Osborne and Gaebler,^[82] state this about the power of performance measurement:

"What gets measured gets done ... If you don't measure results, you can't tell success from failure ... If you can't see success, you can't reward it ... If you can't reward success, you're probably rewarding failure ... If you can't see success, you can't learn from it ... If you can't recognize failure, you can't correct it ... If you can demonstrate results, you can win public support ..."

Therefore, teams in the public sector focusing on the best results for its constituency will earn the respect from the public.

Additionally, according to Convey,^[83] since cross-functional teams usually consist of persons from various backgrounds, they have their own unique strengths and weaknesses, which may not be compatible. It is key that team members be programmed to act in "team-friendly" ways. It is through performance management that can optimize team performance, keep the





momentum going within the team, manage conflict, and identify team progress.

Therefore, with the knowledge and understanding of performance management, team members will be able to clarify strategies and tactics and help the team maintain its momentum to continuously improve.^[84]

Volunteerism

The findings indicate that those persons who volunteered to participate more often on teams scored higher on the KSA test, in particular those that have volunteered for four or more teams. As the team members volunteered more, they acquired more KSA to be effective team members, attaining personal growth in that area.

According to Kellogg and White,^[85] many volunteers are intrinsically motivated by an organization's efforts to accomplishment worthwhile projects. Volunteers offer their time and service for social and psychic rewards, e.g., personal growth and worthwhile work.

Drucker^[86] studied the management of non-profit organizations. He indicates that paid staff and volunteers alike are responsible for their own individual development, not the boss. Drucker further states that only an individual can make oneself effective. This is evident in the current cross-functional team research.

Recommendations

Overall, the research indicates that those cross-functional teams in the public sector organizations have adequate KSA to perform as effective teams. These senior management and political appointees need to tap the expertise of its employees to form more cross-functional teams to focus more on the customers—the users of the public services.

Management needs to move away from the traditional silo functional approach to solving problems and improving services. This may not be easy for employees who have moved up the ranks in the traditional environment. However, various functional areas have insight into problems that are not known by other functions. Management needs to encourage and support more team building efforts, training, and recognition for those teams that have performed well and have measured their success. They may want to include private citizens on the team as well, so that solutions do meet the needs of the customer.

Today, trying to muddle through agencies' red tape is frustrating and troubling for taxpayers. By forming cross-functional teams, agencies can analyze its processes that operate across functional areas and work to make





improvements. Ultimately, the taxpayers will benefit. Process improvements should reduce operational costs and make it easier and simpler for how taxpayers interact with agencies when acquiring services.

Cross-functional teams in the public sector are here to stay; there is no going back. Going forward will be a challenge, but one that will encourage growth in personal development and pride in making a difference to their customers.

This study is only the beginning of research on teams in the public sector. Based on this research, a number of other studies could be conducted. It is recommended that research be conducted in the following areas:

The public sector's budget generally depends upon the budget allocated to its governmental entities. Research could be conducted to determine how funds are allocated for training and whether teams receive training to prepare them as effective participants on a team, resulting in effective outcomes. However, as agencies continue to downsize their training functions, training budget records may no longer be kept making this research challenging.

This study data suggests the more performance management courses taken by a team member, the more the member appears to have gained the KSA to be an effective team member overall. Furthermore, it appears from the study that the more collaboration courses taken impacts the team member's KSA about collaboration within a team. There should be a study that compares collaborative and performance management of team members in the private sector and public sector to determine if training in these areas similarly impacts team participants' KSA to be effective team members in the public and private sectors. This additional research will lay the groundwork to determine if the type of training and the number of courses taken in the public sector vs. the private sector impact collaboration and performance of a team and its members.

A replication of this study should be preformed on an ongoing basis to contribute to the development of future training program design that will enhance team effectiveness. The results of those studies could be used to identify specific training skills and team operating or functional requirements.

From this study, team experience itself appears to influence a team member's overall KSA to be an effective team member. A further study should be conducted to compare those team members who have participated on a limited number of teams vs. those who have participated on many teams. This is to determine if team experience itself provides the KSA to participants to be effective team members. Should future studies replicate this study's findings, it can be said that experience begets the KSA to be an effective team member; therefore, management should encourage team participation at all levels.

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CONCLUSIONS

The purpose of this study is to examine whether members of cross-functional teams in the public sector possess the necessary KSA to be effective team members. This study determines whether a team member is capable of contributing to the effectiveness of the team based on nine variables: (1) number of years of professional work experience; (2) frequency of participation on a team; (3) type of team training received; and (4) situational entry to team assignments (volunteered, assigned, or requested).

The study indicates at the 0.05 level of significance statistically significant factors in determining whether team members have the KSA to be effective team members. These include: number of years of professional work experience, frequency of participation on a team, type of team training received (collaborative and performance management), and situational entry to team assignments (volunteered and assigned).

However, type of team training received, i.e., conflict resolution, communication, planning and task coordination; number of various functions an individual represented on teams throughout his or her career; situational entry to team assignments (volunteered, assigned, or requested), i.e., requested; frequency of training for team-related courses; team member's preference to work alone; organizational encouragement and support for cross-functional teams; and whether there is a relationship between the total KSA team score and the team perception of overall team effectiveness, are not statistically significant factors in determining the KSA of participants in cross-functional teams in the public sector.

Cross-functional teams in the public sector have shown that they have the KSA to be effective teams. It will be necessary for management to pick up the torch and show the way for the employees to encourage and support team building, training, and recognizing those teams that have positively impacted the organization and its customers.

Cross-functional teams should not only continue in the public sector, but should be a way of conducting business within agencies. As the leaders of the organizations, it is imperative that top management and political appointees make use of federal employees KSA to be effective team members. All stakeholders involved will reap the benefits.

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